# Passive Solar Design Guidelines

In passive solar design it is necessary to be sensible about your expectations of the sun. Do not assume that the sun and the house design will provide all of your heating and cooling needs. The climate in North Carolina can vary from cold, relatively cloudy winters to hot, humid, sunny summers. Well-designed passive solar homes provide their owners with low energy bills and year-round comfort, as well as natural daylight. However, improperly designed passive solar homes may actually have uncomfortable temperature swings both in summer and in winter, thereby reducing potential energy savings. When designing the home remember rooms with large expanses of glass should include thermal storage. It is also important to consider the layout of the rooms in passive solar design. (see figure 1-2) Whether adapting passive solar features to a standard home plan or designing an entirely new plan, consider the following design ideas.

- **Frequently-used rooms** (morning to bedtime)- Family rooms, kitchens, and dens work well on the south side. Be aware of potential problems with glare from sunlight through large expanses of windows.
- **Day-use rooms**- Breakfast rooms, sunrooms, playrooms, and offices work well on the south side of the house. They should adjoin rooms that are used frequently to take full advantage of solar heating.
- **Sunspaces**- These rooms can be isolated from the house if unconditioned. In winter, the doors can be opened to let solar heat move into the home. At night, the doors can be closed, and the sunspace buffers the home against the cold night air. In summer, sunspaces protect the home from outside heat gain. For best performance, they should not be air conditioned.
- **Privacy rooms**- Bathrooms and dressing rooms can be connected to solar-heated areas, but are not usually located on the south side.
- **Night-use rooms**- Bedrooms are usually best on the north side, unless used often during the day. It is often difficult to fit thermal storage mass into bedrooms, and privacy needs may limit opportunities for installing large glass areas. However, some homeowners may prefer bedrooms filled with natural light and can use passive solar features effectively.
- **Seldom-used rooms**- Formal living rooms, dining rooms, and extra bedrooms are best on the north side, out of the traffic pattern and air flow.
- **Buffer rooms**- Unheated spaces such as closets, laundries, workshops, pantries, and garages work best against the north, east, or west exterior walls. They protect the conditioned space from outside temperature extremes.
- **Exterior covered areas**- Porches and carports on the east and west provide summer shading. However, west-facing porches may be uncomfortable in the afternoon. Avoid covered porches on the south side, as they shade winter sunlight.

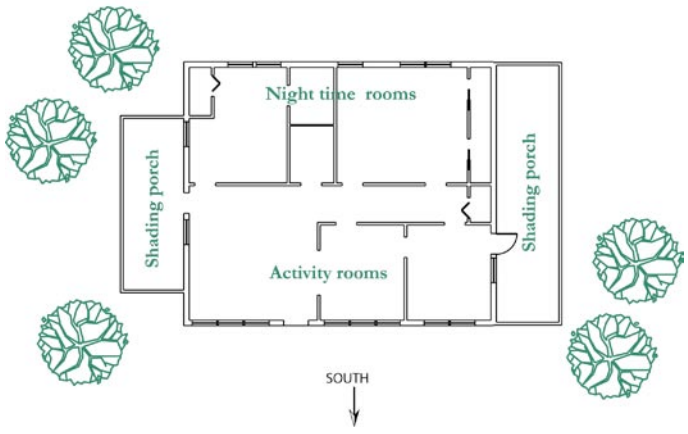


*Figure 1-2 Passive Solar Room Planning*